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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/600,888	08/15/2000	Kingo Suzuki	P107242-0000	4637

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EXAMINER
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TRINH, HOA B

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/600,888	<b>Applicant(s)</b> SUZUKI ET AL.	
	<b>Examiner</b> Vikki H Trinh	<b>Art Unit</b> 2814	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 January 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 7-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 7-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
     If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \*    c) ☐ None of:  
         1. ☐ Certified copies of the priority documents have been received.  
         2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
         3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
     \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
     a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 7 is rejected under 35 U.S.C. 102(b) as being anticipated by Nippon Mining Co (JP 4-250674, applicant's cited abstract)

Nippon Mining Co discloses, with respect to claim 7, a light emitting diode comprising a pellet/layer with a GaAsP mixed crystal, wherein the major front surface is a rough surface.

Note: the examiner treats the phrase "a major front surface" as a portion of the front surface, because the term "major" is a relative term. Also, when a surface is etched, the surface is rough in general. See abstract.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
5. Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nippon Mining Co, as applied to claim 7 above, in view of JP (4-116162).

Nippon Mining Co discloses an LED substantially as claimed in claim 7.

However, Nippon Mining Co does not explicitly state that the side surfaces of the pellet are rough with specific range.

JP (4-116162) shows an LED having a rough side surface 7. See abstract.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the roughening surface of Nippon Mining Co to include the side surfaces, as taught by JP (4-116162), so as to increase the surface area.

With respect to claims 9-10, the combined teaching of Nippon Mining Co and JP (4-116162) does not explicitly state that the side surfaces of the pellet are rough with a specific range.

Nevertheless, it would have been obvious to one skilled in the art at the time the invention was made to provide a specific range for the rough surfaces, since it is prima facie obvious to an artisan's experimentation and optimization because applicant has not yet established any criticality for the specific range.

*Note that the specification contains no disclosure of either the critical nature of the claimed dimensions of any unexpected results arising therefrom. Where patentability is aid to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. (In re Woodruff, 919 F.2d 1575, 1578 (Fed. Cir. 1990).)*

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6. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nippon Mining Co in view of Nishiwaki et al. (59085868).

Nippon Mining Co disclose a light emitting diode comprising a pellet/layer having a surface including a major front surface of which is made of a GaAsP mixed crystal, characterized in that the major front surface is a rough surface. An etching agent, a nitric acid, is used to treat the rough surface. See abstract.

However, Nippon Mining Co does not explicitly teach an etching solution with Br<sub>2</sub> or I<sub>2</sub>.

Nishiwaki et al. (59085868) teaching an etching agent using an etching agent such as an aqueous solution containing Br<sub>2</sub> or I<sub>2</sub>. See abstract.

Therefore, as to claims 11-12, it would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Nippon Mining Co with an aqueous solution containing Br<sub>2</sub> or I<sub>2</sub>, as taught by Nishiwaki et al. (59085868), so as to form fine projections on the major front surface of the pellet.

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nippon Mining Co in view of Nishiwaki et al. (59085868), and further in view of Kinoshita et al. (5,173,130).

Nippon Mining Co in view of Nishiwaki et al. (59085868) teaches the invention substantially as claimed in claim 11. However, Nippon Mining Co does not explicitly specify the concentration range of the compounds in the etching solution.

Kinoshita et al. (5,173,130) teaches an etching solution including nitric acid, phosphoric acid, and acetic acid. See col 3, lines 58-68, col 4, lines 1-2.

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Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the etching solution of Nippon Mining Co with the etching solution, as taught by Kinoshita et al. (5,173,130), so as to stabilize the Ph value of the etching solution. See Kinoshita et al. (5,173,130), col 4, lines 48-51.

With respect to the specific concentration range of the nitric acid, phosphoric acid, and acetic acid in the etching solution, it would have been obvious to one skilled in the art at the time the invention was made to provide a specific range of concentration, since it is prima facie obvious to an artisan's experimentation and optimization because applicant has not yet established any criticality for the specific range.

*Note that the specification contains no disclosure of either the critical nature of the claimed dimensions of any unexpected results arising therefrom. Where patentability is aid to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. (In re Woodruff, 919 F.2d 1575, 1578 (Fed. Cir. 1990).)*

### ***Response to Arguments***

8. Applicant's arguments filed on 07/09/03 with respect to claims 7-13 have been considered but are not deemed to be persuasive.

In the remarks, applicant correctly recites the presently claimed invention which states "a light emitting diode comprising a pellet, a major front surface of which is made of a GaAsP mixed crystal, characterized in the major front surface is a rough surface" (claim 7) and a "fabrication process for a light emitting diode having a pellet, a major front surface of which is made of a GaAsP mixed crystal, characterized in that the pellet is treated with an etching solution of an aqueous solution containing Br<sub>2</sub> or I<sub>2</sub> to form fine projections on at least the major front surface of the pellet" (claim 11).

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However, applicant is wrong to state that Reference '674 does not have a rough surface. In particular, applicant argues for claims 7-13, that when layer GaAsP mixed crystal undergoes a selective etching step, the step causes "No GaAsP" left in "this portion" (Remarks, page 5, line 3). Then applicant reasons that the etching step etches "all the way" to the AlGaInP layer, so there is no expectation of a rough surface. On the contrary, the selective etching step is a step in which the etching process selects a particular area of the GaAsP layer to etch. This means the GaAsP layer may have other portion(s) remaining in the LED. Applicant even admits in the following line of the Remarks (page 5, lines 4-5) that other surfaces of the GaAsP mixed crystal layer are remained and masked. Thus, the etching step may leave a rough surface on some portion(s) of the GaAsP layer, since the etching step does not actually etch all of the GaAsP layer.

For the foregoing reasons, the rejection is proper.

### Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Vikki Trinh whose telephone number is (571) 272-1719. The Examiner can normally be reached from Monday-Friday, 9:00 AM - 5:30 PM Eastern Time. If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Mr. Wael Fahmy, can be reached at (571) 272-1705. The office fax number is 703-872-9306.

Any request for information regarding to the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Also, status information for published applications may be obtained from either Private PAIR or Public Pair. In addition, status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. If you have questions pertaining to the Private PAIR system, please contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

Lastly, paper copies of cited U.S. patents and U.S. patent application publications will cease to be mailed to applicants with Office actions as of June 2004. Paper copies of foreign patents and non-patent literature will continue to be included with office actions. These cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site ([www.uspto.gov](http://www.uspto.gov)), from the Office of Public Records and from commercial sources. Applicants are referred to the Electronic



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Business Center (EBC) at <http://www.uspto.gov/ebc/index.html> or 1-866-217-9197 for information on this policy. Requests to restart a period for response due to a missing U.S. patent or patent application publications will not be granted.

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LONG PHAM  
PRIMARY EXAMINER